

The claims remaining in the application are 11-20.

REMARKS

The Applicants would like to thank the Examiner for the quick and courteous Office Action, and is particularly appreciative of the Examiner's suggestions in overcoming some of the objections and rejections.

Objection to Specification

The Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter, citing 37 CFR §1.75(d)(1) and MPEP §608.01(o). The Examiner noted that in claim 13, the "polyhydric alcohol moieties" of formula (II) are recited as "having 1 to 12 carbon atoms", while in the corresponding portion of the specification, they are recited as "having 1 to 60 carbon atoms, preferably 1-30 carbon atoms" (p. 5, lines 18-19). The Examiner notes that this portion of the specification and/or claim 13 should be revised for consistency.

The Applicants appreciate the Examiner pointing out this inconsistency. The Examiner's attention is respectfully directed to the amendment to claim 13 herein where the phrase "having 1 to 12 carbon atoms" has been amended to recite "having 1 to ~~42~~ 60 carbon atoms" so that the claim is consistent with the specification. It is respectfully submitted that this amendment overcomes the objection to the specification. This change is made to correct an inadvertent clerical error and not for any substantial reason related to patentability. Reconsideration is respectfully requested.

Minor Informalities

The Examiner objected to the disclosure because of the following informalities:

- a. The "Cross-References to Related Applications" paragraph added in the preliminary amendment filed October 17, 2003 is written incorrectly. The Examiner helpfully suggested the following language: "This application is a divisional of U.S. Application Serial No. 09/975,438 filed October 9, 2001, now US 6,656,445 B2, which claims

priority under 35 U.S.C. §119(e) of U.S. Provisional Application No. 60/240,140 filed October 13, 2000.”

b. In paragraph [0022], as amended February 16, 2004, “(e.g. polymerized through the R6 group) should evidently be “(e.g. polymerized through the R⁸ group)”.

Appropriate correction of both of the above is required.

The Applicants greatly appreciate the Examiner pointing out these concerns.

a. With respect to the paragraph “Cross-References to Related Applications”, the Examiner’s attention is respectfully directed to the amendments to the paragraph herein where the Examiner’s exact suggested language has been adopted.

b. With respect to the inadvertently overlooked R6 term in paragraph [0022], the Examiner’s attention is respectfully directed to the amendment to the paragraph herein where the Examiner’s exact suggested term R⁸ has been inserted in place of R6.

It is respectfully submitted that these amendments overcome the objection to the specification. These changes are made to correct inadvertent clerical errors and not for any substantial reason related to patentability. Reconsideration is respectfully requested.

Rejection Under 35 U.S.C. §112, Second Paragraph

The Examiner has rejected claims 11-20 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Said claims are considered vague, indefinite, and/or confusing, because the “contact temperature” limitation recited in independent claim 11 (claims 12-19 dependent thereon) and independent claim 20 is not understood in these **composition** claims. Specifically, it is not clear what is meant by “where the scavenging agent is in liquid form at contact temperature”, given that there is no reference (implicit or explicit) to such “contact temperature” earlier in either **composition** claim 11 or **composition** claim 20. Claims 17 and 18, though clearly in product-by-process form, are still considered confusing, given their use of the past tense “was” (replacing “was” with “is” in both claims 17 and 18 would overcome this aspect of the rejection). Appropriate correction is required. (Bold emphasis in original.)

The Applicants appreciate the Examiner pointing out these concerns.

The Examiner's attention is respectfully directed to claims 11 and 20 where the phrase "at contact temperature" has been deleted from both claims. It is respectfully submitted that these amendments overcome this aspect of the rejection.

The Examiner's attention is respectfully directed to claims 17 and 18 where the word "was" has been replaced with "is" in both claims as helpfully suggested by the Examiner. It is respectfully submitted that these amendments overcome this particular aspect of the rejection. These changes are made to correct inadvertent clerical errors and not for any substantial reason related to patentability. Reconsideration of the rejection is respectfully requested.

35 U.S.C. §102(b) Rejection

The Examiner has rejected claims 11-16, 19 and 20 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Pat. No. 5,552,060 to Roof. The Examiner finds that Roof teaches abatement of hydrogen sulfide with epoxides, **exemplifying** several compositions reading upon these claims of applicants as now broadly recited therein (referring to Roof Abstract and Examples 2, 4, 6-8 and 11). The Examiner notes that in particular, each Roof inventive example in Examples 2, 4, 6-8 and 11 shows a bottle comprising "hydrogen sulfide laden residual fuel oil (#6 oil)" that has been injected with one of the preferred Roof epoxides – styrene oxide, 1-3-butadiene diepoxide, or cyclohexane oxide (i.e. epoxides clearly within the scope of instant claims 11, 13-16, 19 and 20, as well as reading upon formula (II) of instant claim 12) – then stored in an oven at 121°C (referring to Roof Example 2, noting also col. 4, lines 11-13, 22-23). As 121°C is clearly at or above the melting point of sulfur (120°C), the Examiner contends that Roof thus exemplifies compositions containing "molten sulfur contaminated with at least one sulfhydryl compound" (i.e. applicants' component a), as broadly recited in both independent claims 11 and 20), in concert with effective amounts of epoxide scavenging agents reading upon applicants' formula (II); the Examiner further noting that Roof teaches molar ratios of scavenging agent to sulfhydryl compound ("proportional" or 1:1) which fall within the scope of applicants' claim 20 range (referring to col. 3, lines 63-65). Also, the Examiner asserts that as Roof reports no color change for any of these exemplary compositions, the supposed

“molten sulfur” is evidently “not discolored” as required by instant claim 19. Accordingly, the Examiner contends that Roof **anticipates** instant **composition** claims 11-16, 19 and 20, since **compositions** allegedly meeting all required limitations thereof are supposedly exemplified (the Examiner notes that instant claims 13-16 simply recite structural formula limitations for applicants’ non-epoxide scavenging agents **if present**; that is they do not **require** that the scavenging agent be anything other than one of applicants’ component b) species, as recited in independent claim 11). It is appreciated that these Roof examples are “**hydrocarbon substrate**” compositions “having the evolution of hydrogen sulfide therefrom inhibited”, whereas applicants’ claims recite “**molten sulfur**” compositions “having the evolution of hydrogen sulfide therefrom inhibited”. **However**, the Examiner asserts that applicants’ claims are clearly **open** to the presence of **any** additional component, including hydrocarbons, given the use of the transitional phrase “comprising” (referring to MPEP §2111.03). Moreover, the Examiner contends that this different **preamble** language does not patentably distinguish the instant **composition** claims from those compositions clearly disclosed by Roof, given that, again, these Roof compositions allegedly contain all required components in appropriate amounts, with the supposed first required component itself molten sulfur. (Bold emphasis in original.)

The Applicants must respectfully traverse.

The Applicants stipulate that the claimed scavenging agents overlap the Roof epoxides in some instances. However, a patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 U.S.P.Q.2d 1565 (Fed. Cir.), cert. denied, 116 S.Ct. 516 (1995).

All of the pending claims herein require molten sulfur as part of the composition. The single Roof reference *does not* disclose this limitation of the claim. Because Roof does not teach *each and every limitation* of the claim, Roof does not anticipate any of the pending claims.

The Examiner is aware of this deficiency and attempts to cure it, but it is respectfully submitted that it cannot be cured. The Examiner contends that Roof exemplifies compositions containing molten sulfur, but this is incorrect, it is respectfully submitted.

None of Roof's examples mention molten sulfur, and indeed, molten sulfur is not mentioned in Roof at all. Roof's method and compositions are limited to sour aqueous and hydrocarbon substrates (please see *inter alia*, Roof's Abstract; column 1, lines 56-57; column 2, lines 10-13; and claim 1). A *prima facie* case must be put forward by the Examiner; missing facts cannot be assumed, *Ex parte Wolters*, 214 U.S.P.Q. 735 (Bd. App. 1979). It is further respectfully submitted that missing facts cannot be assumed with respect to a proper anticipation rejection based on 35 U.S.C. §102(b) either.

The Examiner further alleges that because the pending claims are open due to the use of the transition phrase "comprising" that hydrocarbons could be included. The Applicants stipulate that while the claims are open, however, the fact remains that the pending claims recite and require molten sulfur and Roof does not even mention it. The fact that the claims are open does not permit the Examiner to assume that a reference teaches an element it does not. Thus, because Roof does not disclose this limitation of all of the claims, no proper rejection based on it has been made under 35 U.S.C. §102(b). Reconsideration is respectfully requested.

For the Examiner's information, dependent claims 12, 13, 14, 15 and 16 have been amended herein so that the nature of the scavenging agent is specifically defined. These amendments are made to further clarify these claims and not for any reason substantially related to patentability.

35 U.S.C. §102(b) or §103 Rejection

The Examiner has rejected claims 17 and 18 under 35 U.S.C. §102(b) as anticipated by **or, in the alternative**, under 35 U.S.C. §103 as obvious over Roof. Roof is relied upon as immediately set forth above, anticipating applicants' independent claim 11 (upon which claims 17 and 18 depend). Initially, it is again noted that instant claims 17 and 18 are in product-by-process form, reciting the manner in which "the scavenging agent was incorporated into the molten sulfur". The Examiner again contends that the Roof inventive examples in Examples 2, 4, 6-8 and 11 allegedly show compositions which appear to contain **all** components as **required** by instant claims 17 and 18 (noting that Roof teaches molar ratios of scavenging agent to sulfhydryl compound ("proportional" or 1:1) falling within the scope of applicants' claim 17 range (referring again to col. 3, lines 63-65)).

Thus, the Examiner contends that Roof may also be considered to **anticipate** claims 17 or 18, **or, in the alternative**, to have rendered compositions falling within their scope *prima facie* obvious, because:

[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). (MPEP §2113).

Alternatively then, if these Roof inventive examples fail in some way to meet the requirements of these two product-by-process claims, then, the Examiner contends that compositions falling within the scope thereof are allegedly *prima facie* obvious, since it would have been within the level of ordinary skill to have determined with minimum testing appropriate processes for making additional Roof compositions “having the evolution of hydrogen sulfide therefrom inhibited”. It is noted that the injection method exemplified by Roof could be considered “physically mixed”, per instant claim 17, and that Roof discusses the presence of H₂S in vapor phase above hydrocarbon substrate compositions, in accordance with instant claim 18. (Bold emphasis in original.)

The Applicants must again respectfully traverse.

Applicants stipulate the holding noted by the Examiner from *In re Thorpe*. However, it is respectfully submitted that the rejections must fail for the same or similar reasons that the previous art rejection discussed above must fail. As previously established, a patent claim is anticipated, and therefore invalid, *only* when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd., id.* (emphasis added) Rejected dependent claims 17 and 18, by virtue of their dependency on claim 11, require and recite the presence of molten sulfur. Roof does not disclose this limitation of the claims. Therefore Roof does not anticipate claims 17 and 18, it is respectfully submitted. Contrary to the Examiner’s supposition, Roof’s Examples *do not* contain all components required by claims 17 and 18: they *do not* contain molten sulfur.

Furthermore, it is respectfully submitted that claims 17 and 18 are not obvious from the teachings of Roof. To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker*, 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). It is respectfully submitted that the Examiner has not met this initial burden here. The Examiner has not established why one having ordinary skill in the art would know only from Roof that *molten sulfur* having the scavenging agents of this invention would have hydrogen sulfide evolution inhibited therefrom. Roof is completely silent about molten sulfur and does not mention or hint at it in any way.

In re Chu, 66 F.3d 292,298, 36 U.S.P.Q.2d 1089 (Fed. Cir. 1995), instructs that to properly determine obviousness, even "minor" changes from the prior art must be evaluated in terms of the entire invention, *including whether the prior art provides any teaching or suggestion to one of ordinary skill in the art to make the "minor" changes that would produce the patented invention*. The suggestion or motivation to make the claimed invention "leaps at a person of ordinary skill in the art from thorough inspection" of a complete prior art device, *Para-Ordnance Manufacturing, Inc. v. SGS Importers International, Inc.*, 73 F.3d 1085, 1090, 37 U.S.P.Q. 1237, 1241 (Fed. Cir. 1995). It is respectfully submitted that the suggestion to substitute molten sulfur for the hydrocarbon or aqueous substrates of Roof does not "leap" to one having ordinary skill in the art since the reference does not even mention molten sulfur once.

"The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) cited in *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990), in turn cited by MPEP §2143.01. There is nothing in the Roof prior art that suggests the desirability of modifying the Roof teaching to replace hydrocarbon or aqueous substrates with molten sulfur.

Elemental sulfur is known not to be a hydrocarbon (or to be aqueous, for that matter). There is nothing in Roof that would suggest his epoxides would have any success with respect to molten sulfur. An important difference is that molten sulfur itself is reactive to many additives. Trying to scavenge H₂S with a chemical agent selective enough for H₂S that does not also react with elemental sulfur was a challenge in addressing the tech-

nical problem solved by the claimed invention. "The teaching or suggestion to make the claimed combination *and* reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991)." (MPEP §2143, emphasis added.) It is respectfully submitted that here neither the teaching or suggestion to make the modification *nor* any expectation of its success is present in Roof. Consequently, it is respectfully submitted that a *prima facie* rejection of obviousness of claims 17 and 18 based on Roof has not been made. Reconsideration is respectfully requested.

It is respectfully submitted that the amendments and arguments presented above place the claims in condition for allowance. Reconsideration and allowance of the claims, as amended, are respectfully requested. The Examiner is respectfully reminded of her duty to indicate allowable subject matter. The Examiner is invited to call the Applicants' attorney at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,
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